

## TRANSFER APPARATUS

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

The present invention relates to a transfer apparatus which displays an image recorded in digital form by a digital still camera (DSC), a video camera, a personal computer or the like through a transmission type image display device formed by a liquid crystal display device (LCD), and transfers the displayed image to a photosensitive recording medium such as an instant photographic film which develops color by light, thereby forming an image.

## 2. Description of the Related Art

Conventionally known examples of a method for transferring (i.e., printing) or recording a digitally-recorded image to or on a photosensitive recording medium include an ink jet system using a dot-type printing head, a laser recording system, and a thermal recording system.

A printing system like the ink jet system has various problems. For example, printing takes time, ink is likely to cause clogging, and precision printing results in the sheet being moistened by ink. The laser recording system

involves an expensive optical component such as a lens, resulting in high apparatus cost. Further, the laser recording system and the thermal recording system require considerable power consumption, and are not suited to be carried about.

Thus, generally speaking, the transfer apparatuses used in these systems and, in particular, the ones used in the ink jet system have a problem in that the more precise the apparatus, the more complicated the driving mechanism and the control mechanism, and the larger and the more expensive the apparatus, printing taking a lot of time.

In this regard, JP 10-309829 A and JP 11-242298 A disclose transfer apparatuses of the type in which a display image is formed on a photosensitive recording medium like an instant film by using a liquid crystal device, thereby achieving simplification in structure and a reduction cost.

The electronic printer disclosed in JP 10-309829 A is capable of copying the display screen of a liquid crystal display on a photosensitive medium to produce a hard copy of a quality equal to that of a photograph. However, in order to copy the display screen of the liquid crystal display on the photosensitive medium in this electronic printer, an optical component such as a rod lens array is

arranged between the display screen of the liquid crystal display and the photosensitive medium, so that a predetermined distance (total conjugate length) is required between them. In the example shown, the requisite distance is 15.1 mm. Further, the optical component is rather expensive.

In the case of the transfer apparatus disclosed in JP 11-242298 A, there is no need to use an expensive optical component such as a lens or to secure an appropriate focal length. Thus, as compared with the conventional transfer apparatuses, a further reduction can be achieved in terms of size, weight, power consumption, and cost. As shown in Fig. 7, a photosensitive film 400 is closely attached to the display surface of a transmission type liquid crystal display (hereinafter referred to as LCD) 300, and a light source (back light 100) provided on the opposite side of the photosensitive film 400 with respect to the LCD 300 is turned on. That is, a fluorescent lamp 101 is switched on to turn on the back light, whereby the image displayed on the LCD 300 is transferred to the photosensitive film 400.

Further, as shown in Fig. 8, the above-mentioned publication discloses another embodiment, according to which a lattice 200 is provided between the back light 100 and the LCD 300, whereby diffusion of light from the back